Department of the Army
Program Manager for
Chemical Demilitarization
Aberdeen Proving Ground, Maryland

Chemical Stockpile Disposal Program

Programmatic Process
Functional Analysis Workbook (FAWB)

Programmatic Process
FAWB
Maintenance Plan

Revision 1
October 16, 2002

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APPENDICES

TABLES

REVISION LOG

REV.#	PAGE(S)	REFERENCE AND DESCRIPTION OF CHANGE
0		Original Issue
1	*1,2,3,4,7,8*	*Updated plan to reflect program changes, including year 2000 PMCSD reorganization*
	2,4,6,9	*Revise plan to allow for FAWB changes with interim change pages.*
	5,6	*Revise plan to reflect TOCDF maintenance of site-specific process FAWBs*
	Appendix A	*Updated acronym list to reflect plan content.*

PROGRAMMATIC PROCESS FAWB

MAINTENANCE PLAN

1.0 PURPOSE. The purpose of this plan is to describe the process by which the systems contractor for training (SCT) shall maintain the programmatic process functional analysis workbooks (FAWBs). This plan identifies the roles and responsibilities of each organization affiliated with the chemical stockpile disposal (CSD) project to support maintenance of current and accurate FAWBs for the process systems.

2.0 OVERVIEW. The programmatic process FAWBs are living documents that describe the chemical demilitarization operations at Anniston Chemical Agent Disposal Facility (ANCDF), Pine Bluff Chemical Agent Disposal Facility (PBCDF), Tooele Chemical Agent Disposal Facility (TOCDF), and Umatilla Chemical Agent Disposal Facility (UMCDF). The FAWBs are subject to configuration control under the CSD project participant quality assurance plan (PQAP). The Design and Systems Integration Contractor (DSIC) initially developed TOCDF FAWBs for 27 systems, including 13 process systems. Once developed, the TOCDF systems contractor (SC) became responsible for maintaining their FAWBs. Separate process FAWBs were planned for the follow-on sites (ANCDF, PBCDF, and UMCDF).

To ensure operational consistency between the sites, *the Office of the Project Manager for Chemical Stockpile Disposal (PMCSD) gave* direction to develop a single set of process FAWBs that would reflect a programmatic philosophy of operation. Several process FAWB systems were added and combined to give a total of *13* programmatic process FAWB systems. The SCT was tasked with developing the programmatic process FAWBs and issuing the revision 0 baseline. Subsequently, the SCT *is* responsible for maintaining the programmatic process FAWBs. The SCT *relies* on input from the FAWB Evolvement/Evaluation Team (FEET) in maintaining the FAWBs.

All site SCs shall remain responsible for site-specific Utility FAWBs and for Process FAWB inputs as indicated in this maintenance plan. *Programmatic process FAWBs were developed* by producing initial drafts of two workbooks approximately every month and a half. *After review and comment on the drafts, comments were incorporated into final drafts that were distributed for review prior to issuance of the revision 0 baseline.*

The first revision of each process FAWB will occur *on an as-needed basis to support the sites during systemization.* Following release of revision 1, each programmatic process FAWB will be reviewed and revised as required on a semi-annual basis.

Interim changes, between revisions, can be made based on site input. These changes are limited to site-specific portions of the FAWB, such as alarm and interlock (A&I) matrices, which are supplied by each site's SC. Change pages will be issued directly and do not require review by all FEET members. Change pages will be incorporated and reviewed by FEET members during the subsequent revision cycle.

3.0 FAWB MAINTENANCE POLICY. This plan establishes the minimum requirements for programmatic process FAWB maintenance, thus providing an accurate and timely source of plant control systems operational baselines and acknowledged and approved differences within the CSD project. Field offices under the PMCSD are responsible for ensuring that the required SC inputs are submitted per the guidelines and format described in this plan.

Maintenance support for the programmatic process FAWB should result in SC procedures which comply with the CSD project baselined operational strategies. This will allow the establishment of a clear and unrestricted means of communicating operational and process design changes to the SCT for future process FAWB *changes and* revisions.

4.0 FAWB MAINTENANCE PARTICIPANTS. The roles and responsibilities for CSD project organizations in support of maintenance of the programmatic process FAWBs are identified in Table *1*:

Table *1*. FAWB Evolvement/Evaluation Team Participation Matrix

Organization	FAWB Maintenance Responsibility Areas
PMCSD Operations *Division*	• Oversight of the process FAWB development and maintenance efforts. • Oversight of responses to programmatic lessons learned (PLL) directed actions for process FAWB revisions. • Ensure that programmatic operational differences identified by development and maintenance of the process FAWBs are resolved and documented. • Review & final approval of FAWB baseline and subsequent revisions.

Table *1*. (continued)

Organization	FAWB Maintenance Responsibility Areas

PMCSD *Technical Management Division*	• Supply the following to the SCT:
	  • *While under the control of the DSIC,* revisions to CSD site, piping and instrument diagrams (P&IDs), panel schedules, single line diagrams, electrical plan drawings (instrumentation and power), interconnection diagrams, and cable schedules for process systems (electronic format preferred).
	  • *While under the control of the DSIC,* documentation and drawing revisions related to the PAS Filter System (electronic format preferred).
	  • Copies of field configuration control board (FCCB) approved engineering change proposals (ECPs) related to process systems
	• Provide resolution to potential programmatic design discrepancies identified during development and maintenance of the programmatic process FAWBs.
	• Oversight of DSIC FAWB deliverables.
	• Enlist support of the *PLL ECP review team's* interdisciplinary expertise in assessing programmatic control code differences (identified during SCT review of the code) and documenting the results of such reviews.
	• Supply to the SCT documentation and drawing revisions related to Treaty Compliance Equipment (electronic format preferred).
	• Oversight of EIC on FAWB deliverables.
	• Ensure interface with EIC on FAWB requirements and applicability to control systems software development are maintained.
	• Ensure that revisions to burner management system (BMS) drawings for future sites are obtained by the SCT from the EIC.
	• Review FAWB baseline and subsequent revisions.

Program Manager for Chemical Demilitarization (PMCD) Environmental & Monitoring Office	• Review FAWB baseline and subsequent revisions.
PMCD Risk Management & Quality Assurance Office	• Review FAWB baseline and subsequent revisions.

Table *1*. (continued)

Organization	FAWB Maintenance Responsibility Areas

Equipment Installation Contractor (EIC) (*Washington Group* - Denver)	The EIC shall:
	• Supply the following to the SCT as they are produced under control of the EIC (electronic format preferred):
	  • Revisions to process control screens.
	  • Revisions to code affecting digital intercontroller communication *input/*output (*DICI/*DICO) listings.
	• Generate graphics files for operator screens.
	• Ensure that changes made to the control code by the EIC prior to delivery to the SCs are reflected in the programmatic process FAWB.
	• Review FAWB baseline and subsequent revisions.

DSIC (Parsons)	The DSIC shall: • Review FAWB baseline and baseline changes in subsequent revisions.
SCT (General Physics - Chemical Demilitarization Training Facility)	The SCT shall: • Manage FAWB maintenance effort, to include review and revision of all process FAWBs on a semi-annual basis. • Coordinate and collect information for FAWB *changes and* revisions. • Supply to the EIC the files needed to generate graphics files for operator screens. • Extract from the site-supplied control system software the information needed to complete DICO listings in the FAWBs. • Update sequencer tables based on latest control system software. • Review all supplied inputs for consistency and accuracy. • Run periodic difference detect on site code to identify changes not already captured. • Generate FAWB *changes and* revisions for FEET review. • Prepare and distribute to reviewers a comment resolution matrix (CRM) that proposes resolutions to all comments. • Resolve and incorporate comments from FEET members. • Deliver and distribute FAWB *changes and* revisions in electronic format. • Incorporate into the FAWBs the *Technical Management Division* resolutions to potential programmatic design discrepancies identified during development and maintenance of the programmatic process FAWBs.

Table *1*. (continued)

Organization	FAWB Maintenance Responsibility Areas

Demilitarization Sites (ANCDF, UMCDF, PBCDF)	• Supply the following to the SCT (electronic format preferred):
	  • Control code changes and revisions (see Appendix B for required source files).
	  • A&I matrix modifications.
	  • DICI/DICO listings for process systems (SCT will extract from control system software).
	  • Instrumentation calibration database changes and revisions.
	  • Documentation (P&IDs, panel schedules, single line diagrams, electrical plan drawings, interconnection diagrams, and cable schedules) to support power source listing changes and revisions (A controlled set of TOCDF drawings is currently sent to the SCT).
	  • BMS drawing changes and revisions.
	  • P&ID *revisions*.
	  • Sequencer spreadsheet changes and revisions.
	  • Updates to process control screens (included with control system software).
	  • Standing operating procedures (SOPs) [available through PMCD data and document control center (DDCC)].
	• Ensure redlines to baseline FAWBs are transmitted to the SCT within 30 days of implementation of any changes.
	• Ensure the need for FAWB revisions are documented in related ECPs.
	• Ensure baseline code, operational procedures, and the programmatic process FAWBs are in agreement with each other.
	• Review FAWB baseline and subsequent revisions.
	  • Verify sequencer tables.

TOCDF Site Project Team	• *Review FAWB baseline and subsequent revisions.*
Johnston Atoll Chemical Agent Disposal System (JACADS) Site Project Team	• Review FAWB baseline and subsequent revisions.
COE	• Review FAWB baseline and subsequent revisions.

5.0 FAWB REVISION PROCESS. The FAWB revision process is a continuous effort. The majority of the burden for supplying input information to the SCT in order to maintain the FAWB current rests with each of the operating demilitarization sites. *Because TOCDF has elected to continue and maintain site-specific FAWBs for process systems, the SCT will use these FAWB updates as sources for revising the programmatic process FAWBs. For ANCDF, PBCDF, and UMCDF,* the sites *are* responsible for maintaining the information that is needed by the SCT to ensure the documents are kept current. *The responsibility for maintaining the process FAWB documents belongs to the SCT.*

At the onset of the task to develop a set of programmatic process FAWBs, TOCDF had an existing procedure for documenting ECP impact on FAWBs and preparing FAWB redlines via a "FAWB Change Form." ANCDF, UMCDF, and PBCDF shall implement similar procedures that identify the requirements to support this maintenance plan and maintenance of the programmatic FAWBs.

To provide an expeditious means of maintaining the programmatic FAWB, two methods shall be enlisted: 1) *FAWB Changes, and 2) FAWB Revisions*.

5.1 FAWB Changes. *Sites may require or desire that specific portions of a FAWB be updated quickly to reflect a change in site configuration. For example, a site may want the programmatic process FAWB A&I matrix updated to reflect a modified alarm setpoint. Instead of issuing a complete revision of the FAWB for review by all FEET members, change pages shall be issued to reflect the change. Change pages will be generated based on input from the site.*

Change pages will be limited to the appendices and tables in the FAWB that the SCs have responsibility for, as specified in section 5.2.1 of this plan.

5.2 FAWB Revisions. *Following issuance of revision 1, each programmatic process FAWB will be reviewed and revised, as required, on a semiannual basis. Individual FAWBs can be revised more frequently, if needed, to reflect significant configuration changes. Programmatic process FAWB revisions can be generated by any of the following:*

- *Engineering change proposals at any of the CSD sites*
- *CSD project programmatic lessons learned*
- *Operational modifications that do not involve hardware configuration changes*
- *Programmatic changes*
- *Need for greater detail or clarification*

To ensure that the FAWBs accurately reflect each site's configuration, each site shall be responsible for maintaining site-specific portions of the FAWB. In addition, the SCT shall perform periodic reviews of site control code to ensure that the FAWBs reflect the sites' control system configurations.

5.2.1 **SC Input Control of Site-Specific Programmatic Process FAWB Appendices and Tables.** SCs shall be responsible for maintaining the site-specific inputs to the programmatic process FAWBs identified in Table *2*:

Table *2*. CSD Site Systems Contractor Programmatic Process FAWB Input Maintenance Requirements

SC Input Item	Format	Submittal Frequency
Redlines to baseline FAWB text (as discussed in text below)	Electronic copy compatible with Microsoft Office™ software.	Within 30 days of implementation of a change.
Alarm and Interlock Matrices	Electronic copy compatible with Microsoft Office™ software.	Redlines, as generated.
Intercontroller Communication Tables (DICOs)	Electronic copy compatible with Microsoft Office™ software.	Redlines, as generated.
Instrumentation Calibration Database	Electronic copy compatible with Microsoft Office™ software.	Redlines, as generated.
Power Source Listings	Electronic copy compatible with Microsoft Office™ software.	Redlines, as generated.
Burner Management System Drawings	Electronic copy compatible with AutoVue™ software preferred (hard copy acceptable).	Redlines, as generated.
P&ID changes	Electronic copy compatible with AutoVue™ software preferred (hard copy acceptable).	Redlines, as generated.
Demil Machine Sequencer Tables	Electronic copy compatible with Microsoft Office™ software.	Trimesterly with control code.
Operator Screens	Electronic copy for conversion to *.gif/*.tif files.	Trimesterly with control code.

Since the site-specific information listed in Table *2* remains the SC's responsibility to maintain, the dependence upon the existing design configuration management control remains. Therefore, the CSD site SCs shall be responsible for developing the appropriate documentation to transmit redline inputs to the SCT required to keep the process FAWBs current. After design changes have been approved, copies of change forms, notices or simply redlines that would be normally used to initiate changes and revisions to the SC-controlled input documentation listed shall be sent to the SCT through the Operations *Division*. The forms, notices or redlines shall be delivered to the Operations *Division* within 30 days of implementation of the change. Approved changes that are not yet implemented, which are normally sent to the *PLL ECP review team* for review, will be reviewed by the SCT for incorporation into the FAWB. Additionally, any time the information in the tables or appendices is formally revised, a copy shall be sent to the SCT through the PMCSD Operations *Division*.

Prior to transfer of control code from the EIC to the SC, the information contained in the sections of the FAWBs listed in Table *2* is either maintained by the EIC or the DSIC, or it is not maintained site-specific. The FAWB input information that is maintained by the EIC includes sequencer tables, BMS drawings[1], DICO listings, and operator screens. The EIC will maintain these documents until the software related to these documents is baselined. The EIC updates the documents based on design information supplied by others. The DSIC maintains the design documents and calculations that are used by the SCT to generate and maintain the power source listings. Updates to the information for these site-specific tables and appendices shall be requested at least trimesterly from the EIC and DSIC, through the PMCSD *Technical Management Division*, until control of this information is transferred to the sites. The SCT may also be added to distribution of revisions to the documents maintained by the EIC and DSIC. The ANCDF, PBCDF, and UMCDF SCs shall generate the instrumentation calibration database as part of baselining the site-specific process configuration. The site-specific instrumentation information for ANCDF, PBCDF, and UMCDF shall be provided by the SC to the SCT after the process systems have been baselined.

5.2.2 Trimesterly Review of Control Code. The control code (see Appendix B for required source files) shall be submitted to the SCT per the schedule shown in Table *3* once the code has been baselined and transferred to the control of the SCs from the EIC.

Table *3*. Control Code Review Schedule

Site	Control Code Due Dates to SCT		
TOCDF	JAN 1	MAY 1	SEP 1
ANCDF	FEB 1	JUN 1	OCT 1
UMCDF	MAR 1	JUL 1	NOV 1
PBCDF	APR 1	AUG 1	DEC 1

Upon receipt of the code by the SCT, a difference detect shall be performed against the previous submittal of the control code from the same site. Two weeks after receipt of the control code, the SCT shall submit through the Operations *Division* to the *PLL ECP review team* a summary of any findings. The summary will include any programmatic differences not previously documented by formal ECPs or PMCSD correspondence. The *PLL ECP review team* will be responsible for reviewing and determining which code differences are site-specific and which are programmatic and should be passed on to other sites. Additionally, the *PLL ECP review team* will document the baseline changes and differences to include final decisions. Any issues or concerns related to control code differences unresolved by the *PLL ECP review team* will be forwarded to the configuration control board (CCB) for deliberation and final decisions.

[1] BMS drawings are maintained until the as-built drawings are received from the vendor and an as-built ECP is generated. At that time, responsibility for the drawings is transferred to the sites.

5.2.3 Revision Process Elements and Schedule. A revision cycle has been established that consists of 5 elements:

- Source documentation letter
- Preparation of draft revision
- Review and comment by FEET
- Comment resolution and incorporation
- Issue of revised FAWB

The revision cycle for each FAWB begins with issuance of a letter indicating the most recent versions of documentation and data (e.g., SOPs, drawings, A&I matrices, programmable logic controller (PLC) code) that will be used to support preparation of the next revision of the subject process system FAWB. The documents that have been revised since the last revision of the specific FAWB will be highlighted. The letter shall be sent to all FAWB maintenance participant organizations for review and comment on the interpretation of the most up-to-date information for preparation of the next revision of the FAWB. The letter shall also identify any other sources of change to the FAWB (e.g., PLL directed actions) for that revision*, including change pages, if any, that were issued since the last revision.*

Participant organizations shall have two weeks to notify the SCT of any discrepancies in the version of documentation that is to be used by the SCT for the next revision. The SCT shall prepare a draft revision to the FAWB which will be distributed to the FEET for review and comment. FEET organizations shall have 30 days to review the FAWB revision and submit comments to the SCT. The SCT shall collect comments and prepare a CRM with proposed comment resolutions. Two weeks after receiving comments, the SCT will distribute the CRM to each organization. Once all reviewers concur with comment resolutions, the next revision of the workbook will be issued. Initial comment resolutions that are not agreed to will be addressed by phone conferences with the interested parties involved. If comments cannot be resolved in this manner, review meetings can be held to achieve final resolution to comments.

FEET representatives will receive electronic copies of all documentation in a format consistent with the FAWB effort. If certain FEET organizations require the documents in an alternate format, the requests will be handled on a case-by-case basis.

The revision cycle for each set of FAWBs will be scheduled to ensure that each process system FAWB is reviewed and revised when required at least every 6 months.

APPENDIX A

Acronyms and Abbreviations

A&I	alarm and interlock (matrix)
ANCDF	Anniston Chemical Agent Disposal Facility
BMS	burner management system
CCB	configuration control board
CDF	chemical agent disposal facility
CRM	comment resolution matrix
CSD	Chemical Stockpile Disposal (Project)
DDCC	data and document control center
DICI	digital intercontroller communication input
DICO	digital intercontroller communication output
DSIC	design and systems integration contractor
ECP	engineering change proposal
EIC	equipment installation contractor
FAWB	functional analysis workbook
FCCB	field configuration control board
FEET	FAWB Evolvement/Evaluation Team
JACADS	Johnston Atoll Chemical Agent Disposal System
MVCU	multi-variable control unit
P&ID	piping and instrument diagram
PBCDF	Pine Bluff Chemical Agent Disposal Facility
PLC	programmable logic controller
PLL	programmatic lessons learned (program)
PMCD	Program Manager for Chemical Demilitarization
PMCSD	Project Manager for Chemical Stockpile Disposal
PQAP	participant quality assurance plan
SC	systems contractor
SCT	systems contractor for training
SOP	standing operating procedure
TOCDF	Tooele Chemical Agent Disposal Facility
UMCDF	Umatilla Chemical Agent Disposal Facility

APPENDIX B

CDF Control System Software Source Files

The chemical agent disposal facility (CDF) control system software source files required by the SCT to maintain the FAWBs are as follows:

PLC-3 TOPDOC files for each controller. For example:

- TOC110.CMT
- TOC110.DBF
- TOC110.LOB
- TOC110.PLC

PLC-5 TOPDOC files for each MVCU. For example:

- TOC110_0.CMT
- TOC110_0.DBF
- TOC110_0.LOB

Advisor PC source files for all control screens. For example:

- DFA.GF (dynamics)
- DFAST.IGE (static)

Advisor PC database files. For example:

- TO_DEMIL.DBA
- TO_FURN.DBA
- TO_UTIL.DBA